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ABSTRACT

This study examined the differential effects of sex of parent, sex of child, and sex of stranger on infant behavior in a stranger-separation situation. Year-old infants (16 males and 19 females) from middle-class families were observed and videotaped twice, at one-week intervals, in a modification of Ainsworth's laboratory stranger and separation situation. Sex of parent, order of parent (which was counterbalanced), and situational episode were varied within subjects, while sex of child and sex of stranger were varied between subjects. Traditional indices of attachment (indirect indices such as disorganization behaviors) suggested that the infants were more attached to their mothers, while positive approach behaviors of the infants suggested a stronger attachment to fathers. Male infants engaged in proximity-contact seeking and contact maintaining behaviors significantly more than expected in the mother situation, while daughters were significantly more likely to perform these same behaviors with their fathers. Data analysis suggests that there is not a unitary construct of attachment, but rather different patterns of attachment behaviors which develop individually in relation to specific figures and as consequences of specified interactional experiences. (Author/BRT)

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Differential Parental Effects Among One-Year-Old Infants in a Stranger and Separation Situation

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The present study was based upon the laboratory research of Ainsworth and her associates (1963, 1964, 1967, 1969, 1974; Ainsworth & Bell, 1969, 1970; Ainsworth, Bell & Stayton, 1971, 1972; Ainsworth & Wittig, 1969) which is concerned with mother-infant interactions and development of attachment. The work of Ainsworth and others, with their extensions to naturalistic observation in homes, represented a major methodological advancement over earlier work based almost entirely upon parental retrospective self reports (for review of early work, see Bowlby, 1969; Caldwell, 1964; Gewirtz, 1972). However, the research on parent-child interaction and development of attachment has focused almost exclusively on mother-child interaction. Historically, the father has been ignored in the research literature in child development. It seems that when the father has been dealth with, the variable of concern has been father absence. Lewis and Rosenblum open the door for possible positive paternal influences by referring to the "caregiver," but they acknowledge the dearth of studies employing the father in parent-child interaction research. The recent work of Kotelchuch and of Kagan represent notable changes.

Therefore, this study was an initial investigation involving the use of a modification of Ainsworth's stranger situation. We were interested in whether or not sex of parent, sex of child, and sex of stranger had any differential effects on the behavior exhibited by infants during the stranger-separation situation. Thirty-five one-year-old infants 16 males and 19 females from middle class families were observed and videotaped twice, at a one week interval. Sex of parent, order of parent (which was counterbalanced), and situational episode were varied within subjects, while sex of child and sex of stranger were subject variables.

Procedures

The parent and child were met by one of the authors and instructions were given as to the method and purpose of the study. The parent and infant were taken to the testing room, which was furnished to resemble a living room. Six toys were placed on the floor, which was marked off into 9 3 x 3 ft. squares. The toys were: a firetruck, blocks, doll, teddy bear, ball, and a toy phone. Video taping took place behind a one-way mirror. The parent placed the infant in the center square, and then was seated in a chair just "off center" in front of the child and off the gridded area. The parent was instructed not to initiate any behavior, but to respond naturally to his or her child. After a 5 minute interval, the stranger entered and was seated next to the parent. This three minute episode consisted of three segments: for 1 minute there was no interaction between the stranger and parent; for 1 minute the parent and stranger talked with each other; and for the final minute, the stranger got on the floor and played with the infant. At the end of this episode, the parent stood up and said "bye-bye" and left the room. The third episode lasted a maximum of 3 minutes, since the parent, observing through the one-way mirror or the TV monitor, could terminate the episode if he or she felt the child was too upset to continue. If the child cried, the stranger attempted to comfort the child and to interest the child in playing with the toys. The fourth episode was considered the first reunion episode. The parent re-entered the room and waited until the child made some form of greeting, either by looking at the parent or locomotion toward the parent. When this occurred, the stranger left the room, and when the child was once again playing with the toys, the parent also left. The fifth episode consisted of the child alone in the room. This episode lasted 3 minutes or it was terminated by the parent if it was believed that the child

was too upset and continuation would cause problems. When this episode was finished the stranger re-entered the room and during the sixth episode, attempted to interact with the child either by active play or by comforting the child. If the stranger was unsuccessful in comforting the child, the parent could once again terminate the episode. At the end of 3 minutes, the parent re-entered the room and waited for the child to react. This final episode. the seventh, was the second reunion episode and lasted approximately 2 minutes.

Results & Discussion

Data were obtained on the manipulation of the six toys; visual response to parent, to stranger, and about the room; crying; touching parent or stranger; locomotion; and vocalizations to parent, to stranger, and to self (vocalization direction was arbitrarily determined by the direction of infant's gaze as the vocalization occurred). The data were collected by time sampling procedures, employing a 15 second interval. Contingency table data, were obtained which assessed various child proximity and contact seeking, contact maintaining, proximity avoidance, and contact resisting behaviors in relation to specified adult actions. A questionnaire was also administered to each parent independently in an attempt to assess prebirth involvement, amount of time spent with child in various activities by spouse and self, and behavioral responses to a crying child.

Strangers were trained via reading, modeling, and videotape feedback. There were 3 male strangers and 5 female strangers. Scorers were trained to a criterion of 80% interscorer agreement before any data scored by them were included in the analysis, and scoring was checked subsequently on a random basis to make certain reliable scoring was being maintained.

Since the length of the episodes varied due to the parents' opportunity to stop an episode if they felt their child was too distressed, the time sampling

data were converted to percentages--i.e., the number of occurrences divided by number of 15 sec. intervals in the episode. Analyses of variance, including sex of parent, order of parent, sex of stranger, sex of child, and episodes were conducted on each of the time sampling variables.

Since the mothers in the sample reported spending considerably more time than the fathers with their children we expected to find behaviors indicating greater attachment to the mothers than to the fathers. However, our time sampling data were not consistent in this regard. In general, infants showed crying behaviors, connoting distress (or disorganization behaviors), significantly more with their mothers than with their fathers ($p<.01$). The only significant sex of child effect was that male infants exhibited "mild" crying more than female infants ($p<.05$). There was also a tendency ($p<.10$) for the infants to exhibit intense crying with female strangers in the reunion and child alone episodes.

A second behavior which has been used to suggest attachment to a parent was touching or clinging behavior. Sex of parent was found to have a significant main effect ($p<.001$) with the infants touching the mother more than the father. This difference was also found to be significant in relation to the infant's behavior toward the stranger. The infants touched the stranger more in the mother present situation than with the father present ($p<.05$).

We classified touch behavior as an example of protest behaviors, because these responses were primarily either holding on tightly to parent during reunion episodes and to the stranger during stranger-child episodes, or a reponse to the appearance of the stranger during the second episode.

If one focuses on direct, positive approach responses as indices of attachment, rather than indirect indices (such as protest, distress, or disorganization behaviors), we find that a number of positive approach responses were made significantly more with fathers than with mothers. Infants vocalized more to

their fathers in general ($p<.05$), as well as particularly in the first episode and in the two reunion episodes. The sex of child by sex of parent interaction tended toward significance ($p<.10$)for the vocalization to stranger response. That is, female infants vocalized more to the stranger when with their fathers than with their mothers, and sons vocalized more to strangers when with their mothers. The infants also tended ($p<.10$) to vocalize more to themselves in the presence of their fathers than in the presence of their mothers. In addition, the infants made significantly more visual responses to their fathers ($p<.001$) than to their mothers (especially in the two reunion episodes and in the first episode), and more visual responses to the stranger in the father-child situation ($p<.05$). The same cross-sex trend ($p<.10$) that was noticed in the vocalization responses, was also present in the visual responses to the stranger.

With respect to exploratory behaviors the infants made significantly ($p<.05$) more visual exploratory behavior (i.e., looking about the room) in the mother-child situation (an exception being in the child alone episode). Visual responses to toys resulted in two puzzling and difficult-to-interpret interactions. A 2-way interaction between sex of parent and sex of stranger ($p<.01$) was found in that the infants looked at the toys more with a male stranger and the mother than with any other combination of parent-stranger. The three-way interaction between sex of parent-sex of child-sex of stranger was significant ($p<.01$) in that the male children looked at the toys more with a male stranger, independent of sex of parent, while the female infants looked at the toys more with opposite sex pairs than with same sex pairs--that is, when stranger and parent were of opposite sex. Infants significantly manipulated the toys more with their fathers present than with their mothers ($p<.01$). A significant interaction between sex of parent and sex of child ($p<.05$) was found in that the difference in toy playing in the presence of the parents and favoring the father was greater for female infants than for

male infants. The separate analyses for the individual toys did not result in any major sex differences, except for the Doll in which females played with the doll more than males ($p<.01$). However, a few interesting cross-sex trends were determined which might relate to sex-typing at an early age.

Even though we were not initially interested in sex-typing when we selected the toys, two of the toys--doll and teddy bear--could be considered to be female oriented and the truck, ball, and blocks to be male oriented. The data suggest that there is a cross-sex effect with the toys. Looking at the behaviors across episodes, males played with the blocks more than females ($p<.01$), while females played with stuffed animal more than males ($p<.05$). There was little difference in the amount of playing with either the doll or stuffed animal between males and females if the mother was present. However, with the presence of the father, manipulation of these two toys greatly increase for females while activity of this sort decreased for the males. This sex of parent by sex of child interaction was statistically significant only for the teddy bear ($p<.01$). With the ball, the pattern was in the opposite direction--no difference with the father present, but males played much more with the ball than girls with the mother present ($p<.10$). Dealing with the blocks, the males played with the blocks more than did the females with the mother present and there was very little difference when the father was present. The one discrepancy in this cross-sex effect was playing with the truck. Males played with the truck more than females when the fathers were present and no difference existed when the mother was present. This is a result, we believe, of the low frequency of the infants playing with the truck. Further research which will investigate sex-typing in this situation has been planned.

The time-sampling data seem to suggest that there does not appear to be a unitary construct of attachment, but rather, as suggested by Ainsworth and Gewirtz, different patterns of attachment behaviors which develop individually in relation

to specifice figures and as consequences of specified interactional experiences. Traditional indices of attachment (indirect, disorganization behaviors) suggest that the infants were more attached to their mothers. However, positive approach behaviors suggest the fathers as stronger attachment figures. It may be that the infants were no less attached to their mothers, but previous interactions between the infants and their mothers were such that distress or disorganization behaviors like crying and clinging were maintained by the mothers. If these behaviors generally are incompatible with positive approach responses, the latter attachment behaviors would be less likely to occur in the mother-child situation relative to the father-child situation. The interactions between the infant and the father appear much more conducive to positive approach behaviors. Since the father in our sample spends relatively little time with the infant, this time is usually spent in play behavior and therefore the father-child situation could trigger such behavior to occur. Also, the child is more accustomed to having the father leave the room and therefore, the anxiety behaviors may be elicited.

Analyses of the contingency table data appear to support the differential parental effects and to add some new aspects. It must be kept in mind that the parent and child behaviors in the contingency table are discrete categories of behaviors allowing statements only about what child behaviors occur concurrently with which parental behaviors. This mode of analysis does not allow analyses of sequential relationships--a major disadvantage. We therefore have conducted chi square analyses of this data. (All chi square results presented were statistically significant at least at the $p<.05$ level).

First of all, when collapsing across all contact maintenance behaviors these infant protest behaviors are exhibited consistently more often with mothers than with fathers in any episode. For example, for those contact maintaining

behaviors occurring in Episode VI (stranger-child; stranger reunion), the child engages in stronger contact-maintenance behaviors (reaching, clinging, resisting being put down vs. merely vocal protest at being put down) when mothers had been present than with fathers. Also in the last parent reunion episode the infants engaged not only in stronger contact maintenance behaviors (reaching, clinging, resisting being put down vs. merely vocal protest at being put down) when mothers had been present than with fathers. Also in the last parent reunion episode the infants engaged not only in stronger contact maintenance behaviors with the mothers, but also are more likely than expected to engage in proximity and contact seeking behaviors along with contact maintenance behaviors with their mothers. The absolute frequencies for the fathers did show more frequent contact seeking and maintaining behaviors than avoidance and resistance behaviors, but the proximity avoidance and contact resistance behaviors occurred more oftne than expected with fathers. Stronger proximity contact seeking behaviors (clambering to get up on parent) were shown in the first reunion with the mother. The reactions to mother's absence in the form of search behaviors were also stronger in all three episodes of parental absence. Further the reactions to the presence of the stranger were more serious in the mother situation than father situation. Specifically, the more serious proximity-avoidance behaviors with respect to the stranger occurred in the mother situations (for the parent-child-stranger episode and the two stranger-child episodes). Just as in the time sampling data these stronger protest behaviors (proximity-avoidance and parental search) appeared to occur more than expected with female strangers than to male strangers.

There were, however, a number of interesting cross-sex effects in <u>all</u> episodes involving both the parent and child. Male infants engaged in proximity-contact seeking and contact maintaining behaviors significantly more than expected

in the mother situation, while daughters were significantly more likely to perform these same behaviors with their fathers. These cross-sex effects occurred in all episodes involving parent and child and in the content of all the parental behaviors in the contingency table. This is interesting in light of similar cross-sex effects observed in the time sampling data for toy manipulation, some of which appear to have some implications for sex typing.

Finally, there were a number of child sex differences which were highly significant, but which were not always consistent. In episode II (parent-child-stranger) male infants were more likely to maintain contact with their parents, while female infants were more likely to seek proximity. With respect to the stranger the male infants sought proximity more while females avoided contact, but, within the proximity avoidance behaviors, male infants exhibited stronger forms of avoidance. In Episode III (stranger and child) it was the reverse--males were more likely to avoid and resist contact with the stranger while females attempted to maintain contact. This was also true in the stranger reunion episode. In the child alone episode the male infants exhibited stronger search behaviors (going to door, remaining there and banging on the door), whereas females merely visually oriented to the door or parent's chair. In the last parent reunion episode the daughters showed much stronger contact maintenance behaviors.

It is apparent from these initial findings that the parent-child interactions in general and attachment behaviors in particular are much more complex than suggested by studying only mother-child interaction (which is complex in and of itself). The father is or can be a very influential figure in parent-child interaction and in the mother-father-child triad. Obviously longer term observations are needed with sequential and system analyses. In addition consideration is needed of family dynamics variables, such as degree of father involvement in the prebirth process and in day-to-day care of infant, and how these variables relate to direct parent-child interaction and development of child, maternal, and parental attachment. We are currently examining our questionnaire data in relation to the time sampling and contingency table data with very interesting results.

Appendix

Contingency Table

Categories of Behaviors: Parent or Stranger

The categories of adult behavior which will be observed are as follows:

1. Person does nothing: this includes behaviors in which the person (i.e., stranger or parent) is not involved in any interaction with the child. He or she may be sitting in the chair, standing in the doorway, sitting on the floor, etc.. He may be conversing with another adult at this time.

2. Person talks to child: The parent or stranger is directing comments to the infant. He or she may be across the room or next to the infant.

3. Person actively engages in play with the infant: The person is either attempting to interest the child in a toy, or is trying to get the child to play with him (this could include asking the child to show him a toy, or encouraging the child to play a game such as peek-a-boo, or patty-cake).

4. Person approaches the child: This includes approaches made by the adult toward the child in an effort to interest him a toy, as well as in an effort to comfort and child.

5. Person comforts the child when he or she is distressed: This includes attempts by an adult to comfort a distressed child, by holding him,

carrying him around, putting his arm around the child and drawing him close, etc..

7. Person attempts to put child down: This involves behavior which will occur after a reunion episode, or situation in which a child has been held and comforted. The parent will attempt to put the infant down on the floor and withdraw from contact.

Contingency Table
Categories of Behavior: Child

The following behaviors will be numbered along a continum of 1-5 with 1 representing the weakest manifestation of a particular category of behavior and 5 representing the strongest manifestation of the behavior.

1. Proximity and contact seeking behavior:
   1. talking or directed vocalization.
   2. a partial approach to the parent or stranger.
   3. active gestures such as reaching or leaning toward the adult, and distressed cries, or offering toys.
   4. a full approach to the adult in which actual physical contact is achieved by the infant touching the person.
   5. clinging to the adult and clambering to get up.

2. Contact-maintaining behaviors, i.e., these behaviors which occur when the adult attempt to put the infant down:

   1. holding onto the adult when being held.
   2. vocal protest at being put down.
   3. reaching up to be picked back up..can be accompanied by vocal protest.
   4. clinging to the adult after he or she has been put down.
   5. resisting release while the adult is initially trying to put the attempt is initially made to put the child down. In this category, infant manifests a determination not to be put down.

3. Proximity and interaction avoiding behaviors--these pertain to a situation which would usually elicit a greeting, approach or at least a visual regard, such as in the reunion episodes, or episodes in which the adult is trying to interact with the child:

   1. initially child looks at adult but quickly looks away.
   2. initially ignoring the adult when an attempt is made to engage his attention, or when the adult enters the room.
   3. pointedly avoiding looking at adult or avoiding touching toys offered by adult--this would appear to be a deliberate refusal of the child to orient to the adult despite attempts to engage the child in interaction.
   4. turning away from the adult.
   5. moving away from the adult.

4. Contact and interaction resisting behaviors:

1. Squirming to get down after having been picked up.
2. after initial contact is made with the adult, the child refuses to be picked up or comforted.
3. pushing or throwing away the toys through which the adult attempts to initiate interaction.
4. pushing away adult who attempts to make contact.
5. hitting, kicking, and/or screaming at adult who attempts to make contact.

5. Search behavior--only in episodes 4,6, and 7):
   1. remaining oriented to the door or glancing at it.
   2. going to the parent's empty chair or simply looking at it.
   3. going all around the room, looking for the parent or visually looking about the room for the parent.
   4. following the adult to the door and remaining at the door.
   5. trying to open the door or banging on it.

Description of Episodes
Instructions to Parent: the stranger situation

Parent is shown the room, the arrangement of the toys, etc..Experimenter leaves, and parent places child on floor next to the toys.

EPISODES

1...Parent and Child (5 minutes)...after placing the child on the floor facing the toys, the parent responds to child quietly or reassures child if this is required, but does not try to get child's attention. We are interested in seeing the kind of interest child has in a new situation. If the child spontaneously begins to play with the toys or explores the room, we let the child continue to do so without interruption for five minutes. If, at the end of two minutes, the child has not begun to play with the toys, a knock will sound on the wall, signalling the parent to take the child over to the toys and to try to arouse interest in them. Then, after a moment, the parent will go back to the chair and we will note what the child does for the rest of the episode.

2...Stranger, Parent, Child (3 minutes)...A stranger enters and introduces himself (herself) briefly to the parent and then goes to the second chair, across from the parent, and sits quietly for one minute. Then the Stranger engages the parent in conversation for one minute, and finally invites the child's attention for one minute. Parent sits quietly in the chair throughout this, talking only when the stranger talks with the parent. We wish to observe what the child's responses are to progressive attention from a stranger, with the parent present but not active.

3...Stranger, Child (3 minutes)...The stranger continues to play with the child as the parent leaves the room as unobtrusively as possible. We note the child's interest in a strange room with only a stranger present. Parent closes the door and goes to the observation room to watch the child through the one-way glass or on the TV monitor. If the child becomes distressed, the parent may stop the episode before the three minutes is up.

4...Parent, Child...An observer will tell the parent when to begin this episode...Parent opens the door, and stands in the doorway...After some hesitation (so that we can see what the child does) the parent greets the child and makes the child comfortable for the next episode by settling the child on the floor playing with the toys.

5...Child alone (3 minutes)...When the observer judges that the child is settled enough to be ready for the next episode, the parent will be signaled to leave the room. The parent picks a moment when the child seems cheerfully occupied with the toys, gets up, and goes to the door. At the door parent pause and says, "bye-bye" to the child, and leaves the room, closing the door behind him (her). We want to see how the child reacts to the parent's departure and what the child will do all by himself in a strange room. If the child becomes distressed, the parent may stop the episode.

6...Stranger, Child (3 minutes)...The stranger re-enters the room and the child's response to the stranger is noted...If the child is distressed in the absence of the parent, the stranger attempts to comfort the child, and the child's reaction is noted. Stranger attempts to get child back to playing with the toys in the absence of the parent.

7...Parent, Child (2 minutes)...Parent re-enters the room, pausing to allow the child to respond. Once child has made some form of response to the parent, the stranger leaves the room. The parent interacts with the child either by talking or playing with the child. Parent attempts to get child back to playing with the toys.